

**Economic Growth and Youth Unemployment Nexus in Nepal:
An Autoregressive Distributive Lag Modeling Approach**

A Research Report

**Submitted To
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**Submitted by
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Abbreviation

ACMD	Advanced Course on Management and Development
ADF	Augmented Dickeye Fuller
AIC	Akaike Information Criterion
ARDL	Autoregressive Distributed Lag
CUSUM	Cumulative Sum of Recursive Residuals
CUSUMSQ	Cumulative Sum of Squares of Recursive Residuals
ECM	Error Correction Model
GNE	Gross National Expenditure
HQC	Hannan-Quinn Criterion
NASC	Nepal Administrative Staff College
PCMD	Professional Course on management and Development
PP	Phillipse Perron
SBC	Schwartz Bayesian Criteria
WDI	World Development Indicator

Abstract

This study aimed to examine the long- and short-run effects of economic growth on youth unemployment in Nepal from 1991 to 2022. The autoregressive distributive lag (ARDL) bounds testing approach and the error correction model were used to detect the long-run and short-run dynamic relationships among the study variables. The bounds test and error correction model both confirmed the presence of co-integration between the variables included in the model. The results revealed that, in the long run, economic growth, gross national expenditure, and population have a significant positive effect on youth unemployment, whereas exports have a significant negative effect. In the short run, economic growth and population have a significant positive effect on youth unemployment, while exports maintain a significant negative effect. Notably, gross national expenditure does not significantly affect youth unemployment in the short run. The findings of this study highlight the need for a multifaceted approach to address youth unemployment in Nepal. This includes promoting export-driven industries, strategically allocating national expenditure, managing population growth, and addressing skill mismatches between the labor force and industry demands. Policymakers should consider implementing targeted interventions to enhance the employability of young individuals and foster job creation in sectors that can effectively absorb the growing youth labor force.

Key words: Youth unemployment, economic growth, export, gross national expenditure, population, Nepal, ARDL

Chapter-1

Introduction

1.1 Growth-Youth Employment Research at NASC: A Crucial Endeavor

As a faculty of Development Studies at the Nepal Administrative Staff College (NASC), it is essential to engage in research concerning the nexus between economic growth and youth unemployment in Nepal. This research is particularly relevant in the context of delivering training sessions focused on developmental perspectives, which are cornerstones of both the Advanced Course on Management and Development (ACMD) and the Professional Course on Management and Development (PCMD). My professional background and current role at NASC closely align with the objectives of this research.

At NASC, one of my responsibilities involves conducting training sessions on development perspectives that encompass a wide range of development issues, including economic growth, economic development, youth employment, population dynamics, remittances, governance, environmental sustainability, and the pursuit of sustainable development goals, among others. In this context, a thorough examination of the nexus between economic growth and youth employment, especially concerning exports, gross national expenditure, and population dynamics, becomes of utmost importance. Such research provides valuable insights into Nepal's complex development landscape.

This research not only contributes to academic discourse but also directly influences the content and direction of the training sessions I facilitate. It equips me with empirical insights that can be seamlessly integrated into the curriculum of the ACMD and the PCMD, thereby enhancing the quality of the training sessions. Moreover, this research holds the potential to benefit not only the participants of these courses but also policymakers, development practitioners, and stakeholders actively involved in Nepal's development agenda.

1.2 Background of the Study

The link between economic growth and unemployment is strong. When the economy grows, more jobs are created, and unemployment goes down. This connection is well-studied in economics, especially through the Okun law. This law shows that as the economy grows

(measured by GDP), unemployment tends to decrease. Okun's research in 1962 found that for every 1% drop in unemployment, there is a 3% increase in real GDP, and the opposite is true as well. So, when the economy grows, employment opportunity increases. The supply and demand theory helps us understand how economic factors affect employment. Different studies by Eichengreen (2020), Efrianti et al. (2020), Soyulu et al. (2013), and others show that when a country's economy grows, it boosts GDP, productivity, and job opportunities. A growing economy, as noted by Chand et al. (2017), leads to more jobs and lower unemployment rates. Conversely, Mihajlović (2020) warns that low productivity can cause economic decline and job losses.

Unemployment and slow economic growth are major global economic problems (Kori Yahia, 2010). In the last 20 years, the increasing issue of youth unemployment has become a big concern for policymakers (Liotti, 2022). High youth unemployment puts a lot of pressure on the economy. It also affects families and society in general, not just the economy (Okicic et al., 2020; Raju & Rajbhandary, 2018). Youth employment is linked to economic, social, and cultural factors (Osborne & Vandenberg, 2022). In developing countries, the youth unemployment rate is very high (Chakravarty et al., 2016), and Nepal is one of them.

The youth unemployment rate in Nepal has changed over time, showing clear patterns. Between 1991 and 2002, it stayed fairly steady at around 19-19.5%. After 2002, there was a gradual decrease in the rate. In 2008 and 2009, there was a noticeable rise in youth unemployment, likely due to the global financial crisis. During these years, the rate peaked at 19.69% and 19.66% respectively. By 2010, it reached 19.71% and continued to drop until 2016, hitting a low of 19.47%. After 2016, there were some ups and downs, but the rate stayed relatively stable until 2020. The most significant change happened in 2020, with a sharp increase in youth unemployment to 24.08% due to the impact of the COVID-19 pandemic. In 2021 and 2022, the rate started to stabilize, though higher than before the pandemic, standing at 20.60% in 2022.

In terms of economic growth, Nepal has historically had low rates, averaging between 2 to 5% (National Planning Commission, 2016). In the fiscal year 2019/20, Nepal experienced a negative growth rate of 2.12%, the first decline in two decades, mainly due to the impact of the COVID-19 pandemic, which was more severe than the losses from the 2014/15 earthquake (Ministry of Finance, 2021). The Asian Development Outlook predicts Nepal's economic growth to slow to

4.1% in fiscal year 2023, down from an estimated 5.8% in fiscal year 2022 (Asian Development Bank, 2023).

The study on economic growth and youth unemployment in Nepal delves into the intricate relationship between these two critical factors shaping the country's labor market landscape. In a nation where the youth face significant challenges in securing meaningful employment opportunities, understanding how economic growth influences the unemployment rate among young individuals is paramount. Understanding the relationship between economic growth and youth unemployment is crucial for policymakers seeking to address this challenge.

1.3 Purpose and Research Questions

The purpose of this study is to analyze the long and short-run effects of economic growth on youth unemployment in Nepal, using time series data from 1991 to 2022. The study seeks to answer the following questions:

- What is the status of youth unemployment and economic growth in Nepal?
- To what extent does economic growth influence youth unemployment in Nepal?
- To what extent do exports, gross national expenditure, and population influence youth unemployment in Nepal?

The answers to this question provide new insights into the relationship between economic growth and youth unemployment in Nepal. In addition to economic growth, this study also provides insights into other factors such as export, gross national expenditure and population that affect youth unemployment in Nepal, both in the short and long run.

1.4 Research Hypotheses

This section presents the research hypotheses formulated to examine the effects of economic growth on youth unemployment in Nepal, drawing upon insights from several past studies.

- H1: Economic growth is negatively associated with youth unemployment in Nepal, both in the long and short run.
- H2: Exports are negatively associated with youth unemployment in Nepal, both in the long and short run.

H3: Gross national expenditure is negatively associated with youth unemployment in Nepal, both in the long and short run.

H4: Population growth is positively associated with youth unemployment in Nepal, both in the long and short run.

1.5 Rationale/Relevance of the Study

Economic growth and youth employment are key issues for the nation's prosperity. Every government wishes to ensure high economic growth and low youth unemployment in the country. Therefore, it is necessary to understand the state of economic growth and youth unemployment, as well as the effect of economic growth on youth unemployment. The empirical evidence and practical implications provided by this study will be valuable for concerned authorities interested in ensuring high economic growth and reducing youth unemployment in Nepal. It will assist them in evaluating the effectiveness of current strategies, guiding evidence-based decision-making, and striking a balance between economic growth and youth employment. Additionally, the study's findings contribute to academic discussions, fill knowledge gaps, stimulate policy debates, and guide future research on economic growth and youth unemployment in Nepal and other similar contexts. The findings of this study bring fresh attention and deeper reflections on the interplay between economic growth and youth unemployment. These are directly valuable for the development perspectives training sessions, which are the central topics of the Advanced Course on Management and Development and the Professional Course on Management and Development conducted at the Nepal Administrative Staff College.

1.6 Scope of the Study

This study focused on economic growth and youth unemployment in Nepal. It also considered control variables like exports, gross national expenditure, and population. The data used in this study covers the years 1991 to 2022 and obtained from the World Development Indicators by the World Bank.

1.7 Organization of the Report

The study report is structured into five main chapters. The first chapter introduces the research with a discussion on the background, purpose, research question, hypothesis, rationale, scope,

and organization of the study. Following this, the second chapter delves into a comprehensive review of the literature concerning economic growth and youth unemployment. The third chapter is dedicated to detailing the study methodology. Subsequently, the fourth chapter presents the results obtained and initiates a discussion around them. Finally, the fifth chapter captures the conclusion, practical implications and limitations.

Chapter-2

Literature Review

2.1 Economic Growth and Youth Unemployment

2.1.1 Global Scenario

Economic Growth

In the early 1990s, GDP growth rates were relatively modest, around 1.37% in 1991 and 2.04% in 1992. As the decade passed, global economic growth steadily improved, surpassing 3% in 1994 and reaching a peak of 4.52% in 2000. This period was marked by a strong global economy and expansionary fiscal policies in various countries. The early 2000s saw some economic shocks, including the bursting of the dot-com bubble and the aftermath of the September 11 attacks. These events caused a temporary dip in global GDP growth, with rates falling to 2.01% in 2001 and 2.30% in 2002. The most significant global economic event during this time was the 2008 financial crisis, which led to a big drop in GDP growth. The rate fell to 2.07% in 2008 and further to -1.34% in 2009. The crisis had a major impact on economies worldwide, causing a recession and a decrease in economic activity. After the global financial crisis, there was a period of recovery, with GDP growth rates rebounding to around 4% in 2010 and 2011. The following years saw more stable growth, with rates between 2.59% and 3.39%. The year 2020, marked by the COVID-19 pandemic, saw a significant drop in the global economy, with GDP growth falling to -3.07%. However, in 2021 and 2022, there were signs of recovery and resilience, with GDP growth rates of 6.02% and 3.08%, respectively (World Bank, 2023). These positive growth rates suggest a rebound in economic activity after the pandemic-induced contraction.

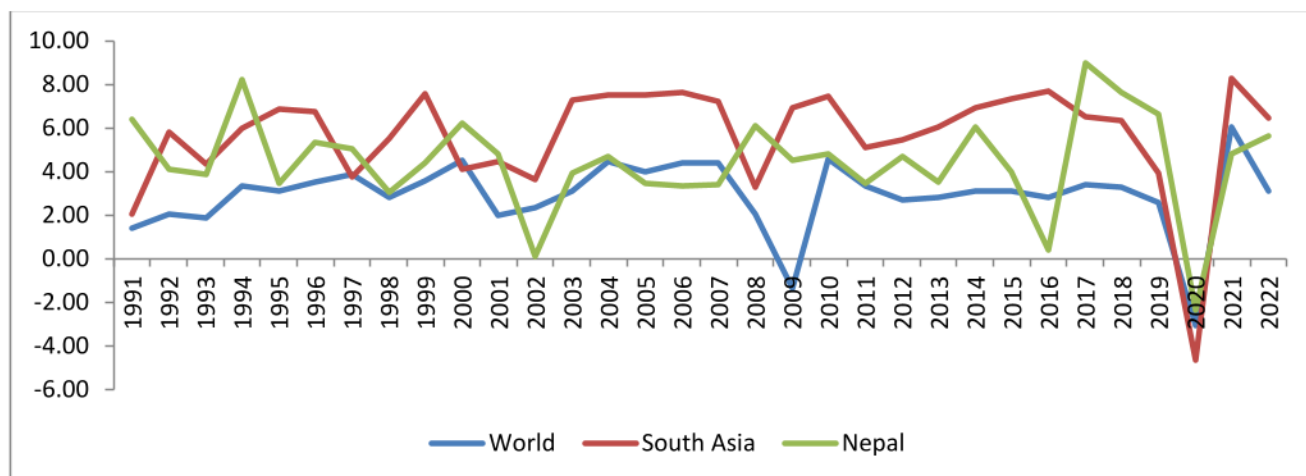


Figure 2.1: Economy growth (GDP growth, annual %) in the World, South Asia and Nepal

Sources: World Development Indicators, World Bank, 2023

Youth Unemployment

In 1991, the global youth unemployment rate was 10.06%, with females facing a slightly higher rate of 10.37% compared to 9.94% for males. This gender imbalance in youth employment continued until 2000, when the overall rate reached 12.97%. Females still had a higher rate of 13.67%, while males were at 12.69%. The global financial crisis in 2008 caused a significant increase in youth unemployment, rising to 13.23%. Gender disparities became more pronounced, with females experiencing a higher rate of 14.31% compared to 12.93% for males, showing that female youth were more affected by economic downturns. This trend continued in 2014, with female youth unemployment at 16.18% and males at 14.80%. The most significant gender disparity occurred in 2020 during the COVID-19 pandemic, with an overall youth unemployment rate of 18.40%. Females were disproportionately affected, with a rate of 20.15%, while males were at 17.85%. Even in 2022, although the overall youth unemployment rate decreased to 15.58%, gender disparities persisted. Females had an unemployment rate of 17.34%, while males were at 15.07% (World Bank, 2023).

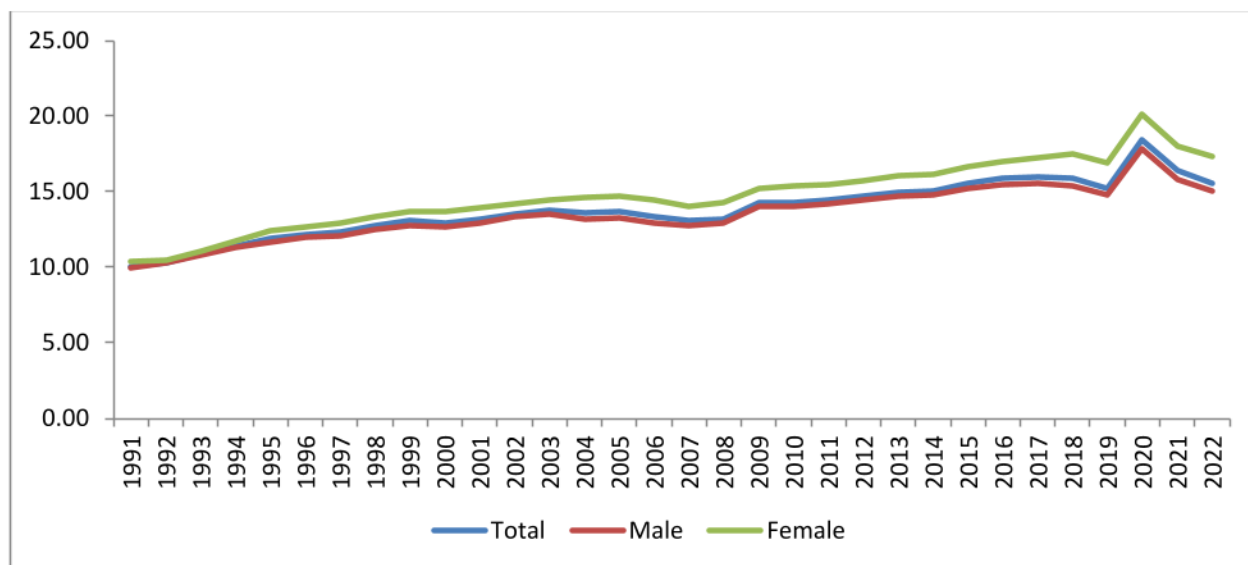


Figure 2.2: Youth unemployment in the World by gender

Sources: World Development Indicators, World Bank, 2023

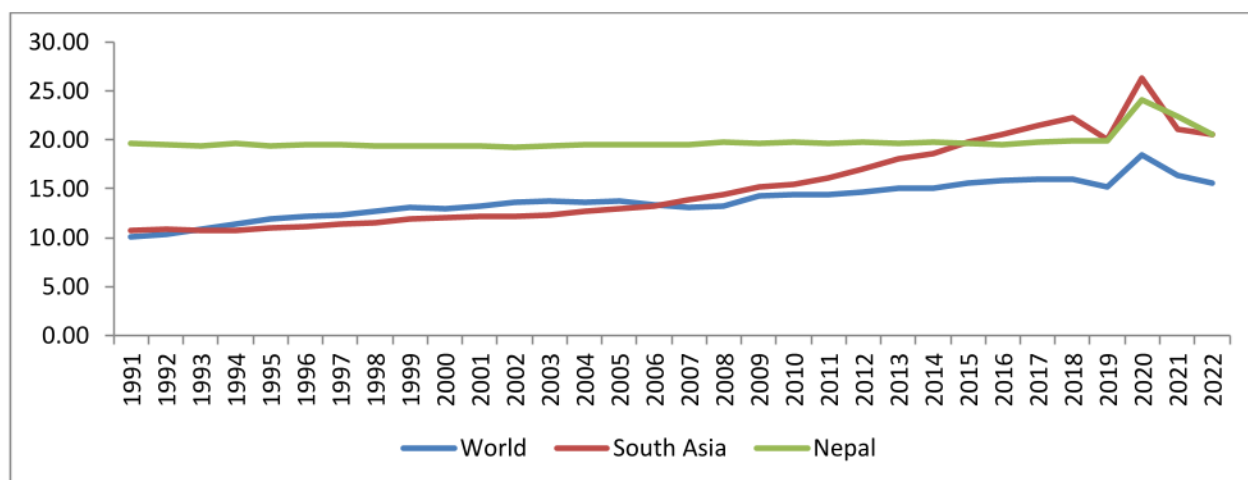


Figure 2.3: Youth unemployment in the World, South Asia and Nepal

Sources: World Development Indicators, World Bank, 2023

2.1.2 South Asia

Economic Growth

In the early 1990s, South Asia saw modest GDP growth rates, ranging from nearly 2% to 5.77%. However, as the 1990s moved into the 2000s, the region experienced a significant economic rise

with consistently high growth rates. Between 2003 and 2007, South Asia achieved impressive GDP growth rates spanning from 7.23% to 7.63%, driven by factors such as economic reforms, globalization, and increased investment. The global economic challenges of the late 2000s had a notable impact on South Asia. The global financial crisis in 2008 resulted in a dip in GDP growth, with the rate falling to 3.26%. Nevertheless, South Asia showed resilience, and by 2010, the region had bounced back with a growth rate of 7.47%. The most significant economic disruption in recent years occurred in 2020 as the COVID-19 pandemic spread across the world. South Asia was not spared from its effects, experiencing a contraction with a GDP growth rate of -4.66%. However, the region showed remarkable resilience in 2021, recording a substantial growth rate of 8.27%. This swift recovery can be attributed to a combination of factors, including government stimulus packages, increased vaccination efforts, and the revival of global trade. In 2022, South Asia continued its positive economic path, registering a GDP growth rate of 6.47% (World Bank, 2023). Although slightly lower than the previous year, this rate signifies the region's ongoing economic recovery and stability.

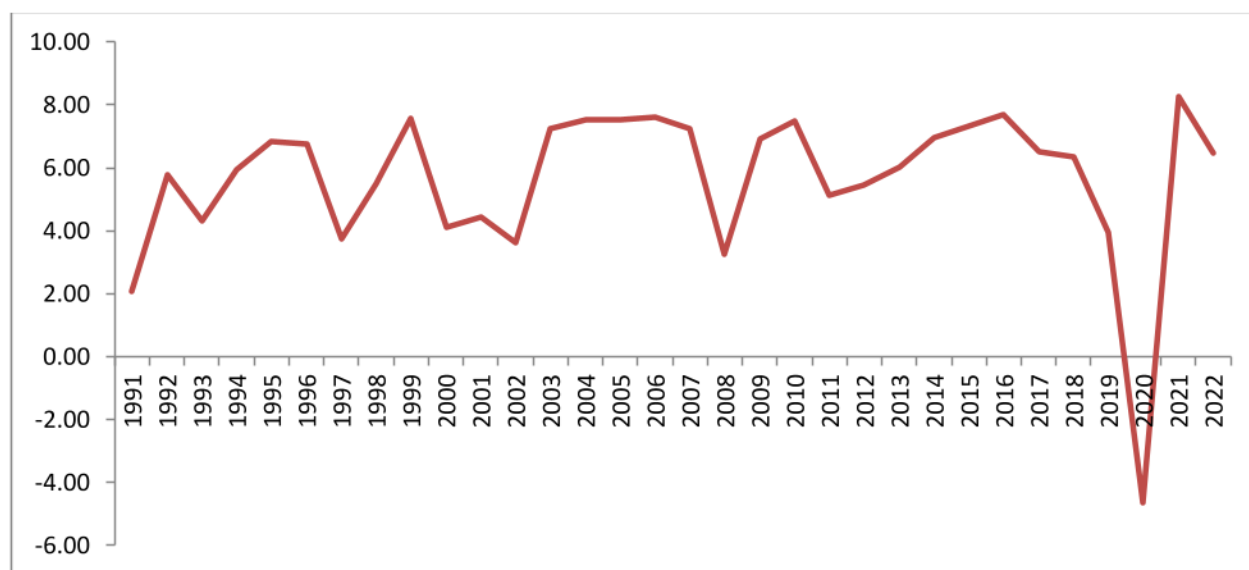


Figure 2.4: Economy growth (GDP growth, annual %) in South Asia

Sources: World Development Indicators, World Bank, 2023

Youth Unemployment

The analysis of youth unemployment in South Asia from 1991 to 2022 reveals several notable trends and gender differences. In the early part of 1991, the youth unemployment rate in South Asia stood at 10.78%, with relatively small gender differences, as males recorded 10.95% and females 10.12%. This gender gap, while present, remained modest during this period. However, a significant shift occurred after the global financial crisis in 2008, leading to a surge in youth unemployment to 14.35%, affecting both genders, although males experienced slightly higher rates. By 2014, youth unemployment had escalated to 18.60%, with females being notably affected, holding a lower rate of 18.18% compared to males at 18.72%. The most profound impact was observed during the COVID-19 pandemic in 2020, resulting in an alarming youth unemployment rate of 26.29%. Gender differences persisted, with females at 26.38% and males at 26.19%. By 2022, there was a modest improvement, yet gender variations remained apparent, with females at 21.43% and males at 20.24% (World Bank, 2023). South Asia has experienced a persistent upward trend in youth unemployment over the decades, made worse by economic crises and the pandemic. Gender differences, although present throughout, became more pronounced during times of crisis.

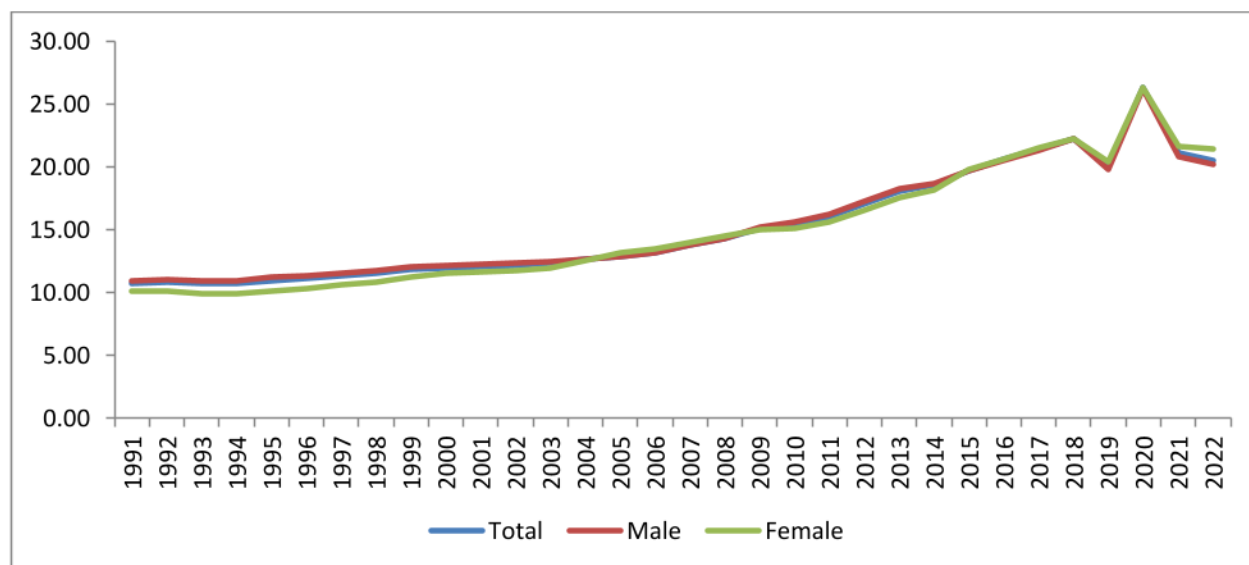


Figure 2.5: Youth unemployment in South Asia by gender

Sources: World Development Indicators, World Bank, 2023

2.1.3 Nepal

Economic Growth

In the early 1990s, Nepal's GDP growth rates showed ups and downs, ranging from 3.47% to 8.22%. The year 1994 saw strong growth, while 1995 experienced a big decline. These variations can be linked to factors such as political instability and economic reforms. The 2000s marked a period of steady economic growth for Nepal, with GDP growth rates consistently exceeding 3%. In 2000 and 2001, growth rates of 6.20% and 4.80%, respectively, reflected economic stability and potential. However, a notable deviation occurred in 2002 when growth plunged to 0.12%, possibly due to external shocks or domestic challenges. Nepal's economy was not spared from the impact of global events. The global financial crisis in 2008 had a substantial effect, leading to a surge in GDP growth to 6.10%, possibly due to increased remittances from Nepali workers abroad. In 2015, the devastating earthquake temporarily slowed growth, resulting in a rate of 3.98%. In 2016, Nepal faced a considerable economic challenge with a growth rate of 0.43%, possibly linked to disruptions caused by the earthquake. However, the country made a remarkable recovery in 2017, with a growth rate of 8.98%, attributed to post-earthquake reconstruction and improved economic policies. This positive momentum continued in subsequent years, with 2018 and 2019 recording growth rates of 7.62% and 6.66%, respectively. The pandemic year of 2020 saw a dip in GDP growth, with a rate of -2.37%. Yet, Nepal showed resilience and economic adaptability, as demonstrated in 2021 and 2022, with growth rates of 4.84% and 5.61%, respectively (World Bank, 2023). These figures showcase the nation's ability to bounce back from challenges. Overall, Nepal's annual GDP growth has been marked by ups and downs, steady growth, and the ability to recover from external shocks. Economic policies, global events, and domestic factors have played significant roles in shaping Nepal's economic performance over the past three decades.

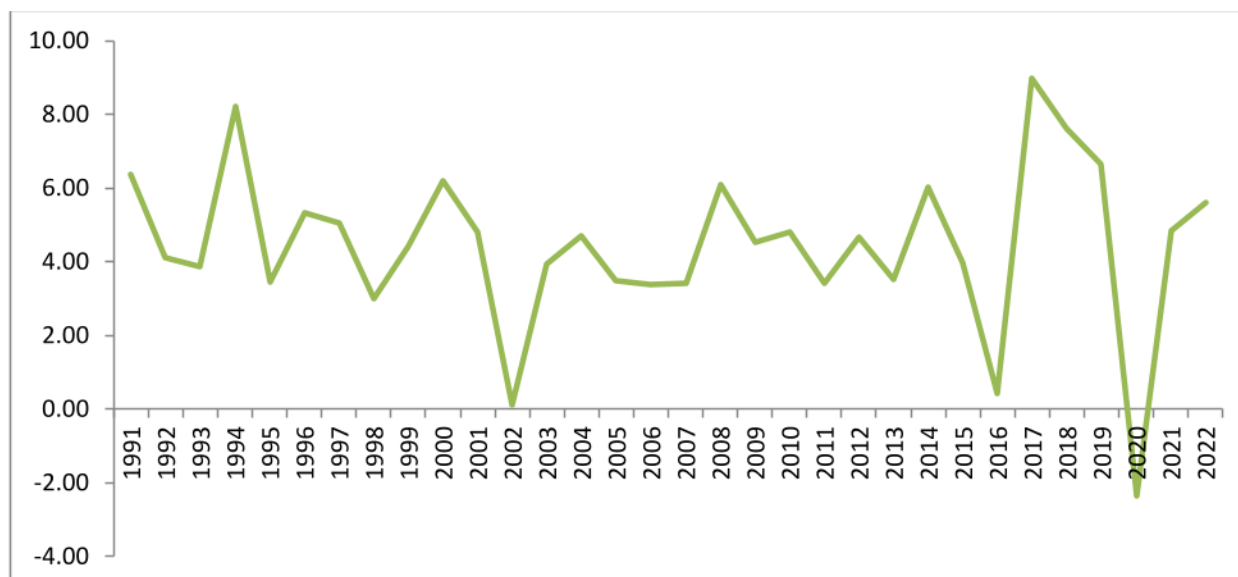


Figure 2.6: Economy growth (GDP growth, annual %) in Nepal

Sources: World Development Indicators, World Bank, 2023

Youth Unemployment

In the early 1990s, from 1991 to 2000, Nepal dealt with an ongoing issue of youth unemployment. The youth unemployment rate started at a high 19.58% in 1991 and remained relatively stable throughout the decade. Gender differences were clear from the start, with females consistently facing higher unemployment rates than males. In 1991, the gender gap was pronounced, with females at 22.68% and males at 18.55%. This period highlights the lasting employment challenge facing Nepal's youth, especially young women.

From 2008 to 2019, Nepal saw significant shifts in youth unemployment dynamics. The global financial crisis of 2008 resulted in a spike in youth unemployment, reaching 19.66% in 2009. Gender gaps persisted, with females at 22.21% and males at 18.56%. However, in the following years, there was a gradual decline in youth unemployment rates, reaching 19.91% in 2019. Gender variations remained, but the gap had slightly narrowed, with females at 22.23% and males at 18.53%.

The most significant disruption occurred in 2020 during the COVID-19 pandemic, with the youth unemployment rate surging to 24.08%. Gender gaps remained stark, with females at 27.04% and males at 22.37%. This event highlighted the vulnerability of youth employment to external shocks and underscored the disproportionate impact on female youth employment.

By 2022, there was a modest recovery, with the overall rate decreasing to 20.60%. Gender gaps persisted, with females at 23.53% and males at 18.98%. This data highlights Nepal's ongoing challenges with youth unemployment, the persistent gender gaps in youth labor force participation, and the significant influence of external crises, such as the global financial crisis and the COVID-19 pandemic, on youth employment.

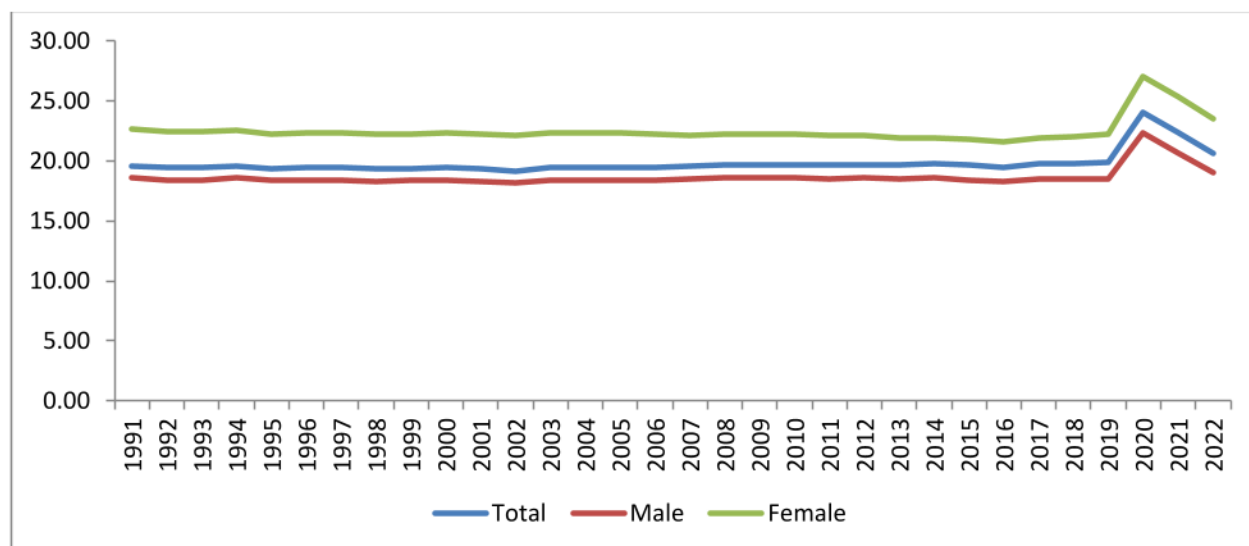


Figure 2.7: Youth unemployment in Nepal by gender

Sources: World Development Indicators, World Bank, 2023

2.2 Past Studies

A review of past research shows that Okun's (1962) work is very important in studying the link between unemployment and income in the United States from 1947 to 1960. This key research, called 'Okun's law,' explains the crucial growth level at which the unemployment rate starts to go down. Okun found that a 1% rise in real GDP in the United States leads to a 0.4% drop in the unemployment rate. Also, when the growth rate hits 3%, the unemployment rate tends to stay the same, and any growth above this level causes the unemployment rate to fall due to new jobs being created.

Shin et al. (2014) studied how output and unemployment relate in the USA, Canada, and Japan from 1982 to 2003. They found that GDP and unemployment are linked negatively, supporting Okun's theory in these countries. In another study by Mazorodze and Noureen (2018) on GDP and unemployment in South Africa from 1994 to 2017, they noticed that unemployment rose during deflation but only slightly decreased during economic recovery. This shows that just economic growth may not solve unemployment issues. Neifar (2020) explored the GDP and unemployment connection in MENA countries from 2000 to 2014, finding a long-term asymmetry in most countries except Oman, which showed short-term differences. Adeleke (2020) looked at youth unemployment and economic growth in Nigeria from 1991 to 2018, discovering that high youth unemployment and interest rates negatively affect economic growth, while education spending and youth enrollment have a positive impact on Nigeria's economy.

Enejoh and Ahmad (2019) studied the unemployment and economic growth link in Nigeria from 1970 to 2016. They found that high youth unemployment and interest rates negatively impact Nigeria's economic growth in both the short and long term. Nweze (2019) looked at how youth unemployment affects economic growth in Nigeria from 1989 to 2017, showing that youth unemployment harms economic growth and development. Mosikari (2018) examined the effect of the youth unemployment rate on South Africa's GDP from 1988 to 2015. The study found that government spending, investment, and school enrollment help economic growth, but youth unemployment and interest rates hurt South Africa's economy. Awogbenle (2010) studied the impact of youth unemployment on economic growth in Ghana from 1985 to 2013, revealing that high youth unemployment and interest rates significantly reduce Ghana's economic growth.

Kreishan (2011) looked at the connection between unemployment and economic growth in Jordan from 1970 to 2008. The study showed that just a lack of economic growth is not enough to explain why there is unemployment in Jordan. Abdul-khaliq (2014) studied the link between unemployment and GDP growth in nine Arab countries from 1994 to 2010. The research found that economic growth reduces unemployment and that a growing population contributes to unemployment. Soylu et al. (2018) examined the relationship between unemployment and economic growth in Eastern European Countries from 1992 to 2014, using Okun's law. They found that unemployment and GDP growth are connected and that economic growth reduces unemployment. Nagel (2015) investigated the relationship between GDP growth and unemployment, showing that economic growth and unemployment are negatively correlated.

Xesibe (2020) studied the effect of unemployment on GDP growth in South Africa from 1994 to 2017, finding that high unemployment rates slow down economic growth in South Africa.

2.3 Okun's law

Okun's law, first postulated by economist Arthur Okun in 1962, provides the theoretical foundation for the relationship between economic growth and unemployment. Okun found that for every 1 percentage point reduction in the unemployment rate, there was an associated 3 percentage point increase in output growth in the US economy (Adachi et al., 2015). Okun's law states that there is a negative correlation between changes in the unemployment rate and changes in output growth. This empirical regularity has been regarded as a building block of traditional macroeconomic models. However, growth theory usually assumes full employment, since it focuses on long-run phenomena. There is a need for medium-run macroeconomic theory that focuses on persistent unemployment or stagnation in relation to Okun's law. The exact quantitative form of this relationship varies between countries and over time (Cuaresma, 2008). The current version of Okun's law in the US states that a 1 percentage point decline in the unemployment rate is associated with additional output growth of about 2 percent. To identify the factors causing these differences, a theory that explains this empirical law is required (Adachi et al., 2015).

The theoretical foundations of Okun's Law have been a subject of study and debate. While Okun's Law is primarily an empirical observation, various studies have attempted to provide theoretical frameworks to explain this relationship. One such version is the "strong hysteretic" model of Okun's Law, which emphasizes the influence of past growth shocks on current unemployment rates (Gordon, R2010). This model introduces a hysteresis property, where historical factors impact the current state of unemployment and growth. Despite being an empirical observation, Okun's Law has proven to be a valuable tool for predicting trends between unemployment and real GDP (De Castro et al., 2022). However, the accuracy of this prediction can vary due to factors like Okun's coefficient, leading to discrepancies between theoretical forecasts and real-world data. While Okun's Law is more reliable for short-run predictions, its utility for long-run analysis and precise numerical calculations is limited (Adenomon & Tela, 2017). Nonetheless, economists continue to use Okun's Law as a guideline for understanding the relationship between employment levels and economic output.

2.3 Study Framework

This study follows the framework shown in Figure 8. In Nepal, youth employment is affected by various factors like economic growth, exports, national spending, and population changes. Economic growth plays a big role in youth employment. When the economy grows and diversifies, there is more need for skilled workers. This creates better job opportunities for young people. Also, economic growth can lead to improved infrastructure, more education opportunities, and training access, making young individuals more employable.

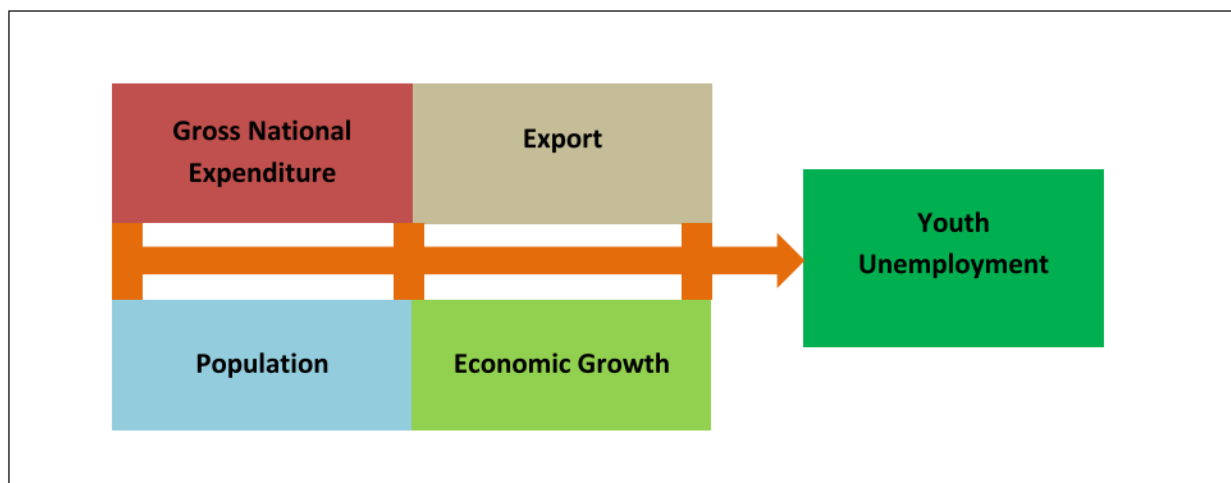


Figure 2.8: Study framework

Exports also play a vital role in how young people find jobs in Nepal. When Nepal's products and services can sell well internationally, it boosts the economy and creates jobs, especially in sectors like textiles and farming that focus on exports. With more exports, new job chances open up for young individuals, usually beginning at basic levels but providing opportunities for learning skills and advancing careers. However, it's important to remember that how exports affect jobs can be affected by how stable international markets and trade agreements are.

The gross national expenditure has a direct effect on how young people find jobs in Nepal. When the total spending goes up, it usually means more economic activity and government spending. This leads to more job options for young people, especially in areas like building infrastructure, education, healthcare, and public services. Also, when total spending increases, it can encourage businesses to invest more, creating more job opportunities for young individuals as companies grow and hire more workers.

Population growth, like economic growth, exports, and national spending, greatly impacts youth employment. As the population grows quickly, especially among young people, there is strong competition for the few available jobs. This imbalance in the number of young people versus available jobs often leads to higher rates of youth unemployment, as the job market struggles to provide enough opportunities for the increasing number of young job seekers.

Chapter-3 Study Method

3.1 Variables and Data Sources

The analysis of the study was based on 31 years of annual time series data covering the period from 1991 to 2022, with the start and end periods selected based on data availability. The data on youth unemployment (% of the total labor force aged 15-24), GDP growth (annual %), exports (% of GDP), gross national expenditure (% of GDP), and population (total) were obtained from the official website of the World Bank. The dependent variable of this study, youth unemployment, was measured by the percentage of the total labor force aged 15-24 who were unemployed, while the independent variable, economic growth, was measured by GDP growth (annual %). Various control variables, namely exports, gross national expenditure, and population, were also used. All variables were transformed into logarithmic form. Details of the study variables, their definitions, and sources are presented in Table 3.1.

Table 3.1: Variables definitions and sources

Variables	Descriptions	Data Sources
Youth unemployment	Youth unemployment refers to the share of the labour force ages 15-24 without work but available for and seeking employment.	World Development Indicators, World Bank (2022)
GDP growth (annual %)	GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for the depreciation of fabricated assets or for the depletion and degradation of natural resources.	World Development Indicators, World Bank (2022)
Exports (% of GDP)	Exports of goods and services represent the value of all goods and other market services provided to the rest of the world. They include the value of merchandise, freight, insurance, transport, travel, royalties, license fees, and other services, such as communication, construction, financial, information, business, personal, and government services. They exclude compensation of employees and investment income (formerly called factor services) and transfer payments.	World Development Indicators, World Bank (2022)
Gross national expenditure (% of GDP)	Gross national expenditure is the sum of household final consumption expenditure, general government final consumption expenditure, and gross capital formation.	World Development Indicators, World Bank (2022)
Population (total)	Total population is based on the de facto definition of population, which counts all residents regardless of legal status or citizenship.	World Development Indicators, World Bank (2022)

3.2 Empirical Framework

After introducing the study variables, this study employed the Cobb-Douglas production function framework to formulate a predictive model for assessing the influence of economic growth on youth unemployment in Nepal. The Cobb-Douglas production function posits that output is a function of total factor productivity (Ishtiaq et al., 2016). Consequently, youth unemployment is contingent upon various economic indicators. The general form of this production function is articulated in the equation as follows:

$$YU = f(GDP, E, GNE, P) \quad \text{Equation (1)}$$

The empirical model for estimation is developed as follows:

$$YE_t = \beta_0 + \beta_1 GDP_t + \beta_2 E_t + \beta_3 GNE_t + \beta_4 P_t + \varepsilon_t \quad \text{Equation (2)}$$

All variables in this study are expressed in logarithmic form. Consequently, the empirical models for estimation are developed as follows:

$$\ln YU_t = \beta_0 + \beta_1 \ln GDP_t + \beta_2 \ln E_t + \beta_3 \ln GNE_t + \beta_4 \ln P_t + \varepsilon_t \quad \text{Equation (3)}$$

Where, YU is youth unemployment, GDP is GDP growth, E is export, GNE is gross national expenditure, P is population, and ε_t is the error term.

3.3 Unit Root Test

Most studies on time series analysis rely on the assumption of stationarity. Thus, the Unit Root Test was employed to assess whether the data exhibit stationarity at the level, first difference, or second difference (Pokhrel & Khadka, 2019). In this context, the Augmented Dickey–Fuller (ADF) and Phillips–Perron (PP) unit root tests, as presented in equations 4 and 5, respectively, were used to identify the stationary properties of time series variables at both the level and first difference.

$$\Delta \ln U_t = \alpha_0 + \alpha_1 \ln U_{t-1} + \sum_{j=1}^k f_j \Delta \ln U_{t-1} + \varepsilon_t \quad \text{Equation (4)}$$

$$\Delta \ln U_t = \alpha + E^* \ln U_{t-1} + \varepsilon_t \quad \text{Equation (5)}$$

In the provided equations, ε_t represents the error term, Δ denotes the first difference operator, U_t is a time series, α_0 stands for the constant, and k represents the optimal number of lags for the

dependent variable. The ADF test aims to determine whether the estimates of coefficients are equal to zero and provides a cumulative distribution of ADF statistics. A variable is considered stationary if the coefficient value of α_1 is less than the critical values. The Phillips–Perron (PP) unit root test also relies on t-statistics associated with the estimated coefficients of E^* . When dealing with a non-stationary time series Y_t that becomes stationary when differenced once, it is said to be integrated of order one and is denoted as $I(1)$. If the series is stationary at the level, for example, Y_t (non-differenced), it is denoted as $I(0)$ (Brooks, 2014). In practice, rejecting the null hypothesis of non-stationarity in favor of the alternative hypothesis of stationarity is more suitable for conducting time series analysis. Such rejection implies that Y_t is stationary and integrated of order zero, or $I(0)$. Conversely, if the null hypothesis of a unit root for the first difference is rejected, then the first difference is stationary, and the variable is integrated of order one, denoted as $I(1)$ (Johansen, 1988).

3.4 ARDL Model

In this study, ARDL cointegration methods, originally introduced by Pesaran and Shin (1999) and further extended by Pesaran et al. (2001), were applied to examine the long-run relationship among the variables. This approach offers several advantages over other traditional cointegration methods such as Engle-Granger (1987) and Johansen-Juselius (1990). ARDL can be applied irrespective of whether the variables under study are integrated of order $I(0)$ or $I(1)$, or a mixture of both (Pesaran & Shin, 1999). It estimates cointegration relationships using ordinary least squares (OLS) techniques (Ruzima & Veerachamy, 2021). Unlike other cointegration techniques, ARDL does not impose a restrictive assumption that all the variables under study must be integrated in the same order. Similarly, unlike Johansen cointegration, which requires a large sample size to ensure the reliability of the results, small sample properties can be better estimated with the ARDL approach (Pesaran et al., 2001; Haug 2002; Narayan & Smith, 2005; Guan et al., 2015). Moreover, the estimation of results is possible even if the explanatory variables are endogenous (Pesaran & Shin, 1999; Pesaran et al., 2001). Both short-run and long-run parameters of the model can be estimated simultaneously (Pokhrel & Khadka, 2019). This method provides unbiased estimates of the long-run model and valid t-statistics because it avoids the problems that may arise due to serial correlation and endogeneity (Harris & Sollis, 2003; Odhiambo, 2009). Hence, the approach is suitable for analyzing the underlying relationship and

has been increasingly used in empirical research in recent years (Rana, 2018). The ARDL model is developed for estimations as follows:

$$\begin{aligned} \Delta \ln YU = & \gamma_0 + \gamma_1 \sum_{i=1}^p \Delta \ln YU_{t-i} + \gamma_2 \sum_{j=0}^q \Delta \ln GDP_{t-j} + \gamma_3 \sum_{k=1}^r \Delta \ln E_{t-k} + \gamma_4 \sum_{l=1}^s \Delta \ln GNE_{t-l} + \gamma_5 \ln YU_{t-1} \\ & + \gamma_6 \ln GDP_{t-1} + \gamma_7 \ln E_{t-1} + \gamma_8 \ln GCE_{t-1} + \gamma_9 \ln P_{t-1} + \epsilon_t \end{aligned}$$

Equation (6)

Where γ_0 represents constant and ϵ_t denotes the error term. The error correction dynamics are indicated by the summation sign, while the second part of the equation corresponds to the long-run relationship. Schwarz Bayesian Criteria will be employed to identify the optimal lag for each series in the model. To assess whether the variables exhibit a long-run relationship, the F-statistics value is estimated. If the calculated F-statistics exceed the upper-bound critical values, the null hypothesis of the 'non-existence of a long-run relationship' is rejected. Conversely, if the F-statistics fall below the lower-bound critical values, the null hypothesis that suggests the 'non-existence of a long-run relationship' is not rejected. When the F-statistics value falls between the upper and lower critical bounds, the result remains inconclusive. The following model was used to estimate the long-run coefficients:

$$\ln YU = \partial_0 + \partial_1 \sum_{i=1}^p \ln YU_{t-i} + \partial_2 \sum_{j=0}^q \ln GDP_{t-j} + \partial_3 \sum_{k=1}^r \ln E_{t-k} + \partial_4 \sum_{l=1}^s \ln GNE_{t-l} + \partial_5 \sum_{m=1}^t \ln P_{t-m} + \epsilon_t$$

Equation (7)

After confirming the co-integration between economic growth and youth unemployment, the associated error correction model (ECM) was estimated. This model, also known as the short-run coefficients, illustrates the speed of adjustment required to restore long-run equilibrium following a short-run shock.

$$\begin{aligned} \Delta \ln YU = & \partial_0 + \partial_1 \sum_{i=1}^p \Delta \ln YU_{t-i} + \partial_2 \sum_{j=0}^q \Delta \ln GDP_{t-j} + \partial_3 \sum_{k=1}^r \Delta \ln E_{t-k} + \partial_4 \sum_{l=1}^s \Delta \ln GNE_{t-l} + \partial_5 \sum_{m=1}^t \Delta \ln P_{t-m} \\ & + n \text{ECM}_{t-1} + \epsilon_t \end{aligned}$$

Equation (8)

Where 'n' represents the coefficient of the error correction model (ECM_{t-1}), signifying the speed of adjustment toward long-run equilibrium following a shock to the system. The ECM reconciles

the short-run dynamics with the error adjustment process toward long-run equilibrium (Barik & Sahu, 2022).

The Granger Causality test was employed to examine the direction of causality among the variables. This test helps determine which variable influences another and in what direction.

To assess the goodness of fit and robustness of the model, various diagnostic tests were used. These included tests for serial correlation, normality, functional form, and heteroscedasticity. Additionally, the Cumulative Sum of Recursive Residuals (CUSUM) and the Cumulative Sum of Squares of Recursive Residuals (CUSUMSQ) tests were used to detect and verify the stability of the parameters to be estimated. All of these analyses were performed using EViews Software.

3.5 Qualitative Information

In addition to quantitative methods, this study utilized qualitative data to enrich the findings and offer deeper insights. Key informant interviews were conducted with representatives from the Ministry of Labor, Employment, and Social Security. Participants were selected through purposive sampling to ensure a diverse range of perspectives on economic growth and youth employment. Semi-structured interviews were employed, allowing flexibility while consistently covering key topics. This qualitative component complements the quantitative analysis by providing context, explanations, and a nuanced understanding of economic growth and youth unemployment.

Chapter-4 Results and Discussion

4.1 Unit Root Tests

Before proceeding to the cointegration bound test, this study conducted ADF and PP unit root tests at both the level and in first differences to ascertain the stationary properties (order of integration) of the study variables. The results of the ADF and PP unit root tests are presented in Table 4.1, indicating that some variables are stationary at the level while others are stationary in the first difference. These results suggest the presence of a combination of I(0) and I(1) variables, with none of them demonstrating I(2) or higher characteristics. This allows for the utilization of the ARDL cointegration test to examine the long-term relationship between economic growth and youth unemployment in Nepal.

Table 4.1: Unit Root Test Results

Variables	ADF Test Statistics				PP Test Statistics			
	Level	First Difference		Level	First Difference			
	C	C & T	C	C & T	C	C & T	C	C & T
LN YOUTH_EMP	0.4209	-0.9035	-0.4663	0.2151	-2.6517*	-3.4073*	-8.3966***	-0.9593***
LN GDP	-5.6305***	-5.5207***	-5.0581***	-5.0038***	-5.8066***	-5.6239***	-18.0624***	-5.9007***
LN EXPORT	-0.3906	-.4467***	-.0444***	-3.9106**	-0.4753	-.6338***	-5.1920***	-4.9765***
LN NE	-0.0799	-2.7974	-6.6288***	-6.6658***	0.2437	-2.7974	-6.6858***	-6.7874***
LN POP	-0.0799***	-2.0769	-2.2704	-1.1572	-2.8858*	-2.8503	-1.9297	-0.3818

Note: (*) Significant at the 10%; (**) Significant at the 5%; (***) Significant at the 1%. and (no) Not Significant

4.2 Lag Length Selection

This study also determined the vector autoregression order, which represents the number of lags to be included before conducting the cointegration test (Shakil et al., 2018). The Akaike Information Criterion (AIC), the Schwartz Bayesian Criteria (SBC), and the Hannan-Quinn Criterion (HQC) were employed to identify the most suitable lag length. The results of these tests, presented in Table 4.2, indicate that the optimal number of lags is 2.

Table 4.2: The Optimal Lag Length

Lag	AIC	SC	HQ
0	-14.03409	-13.79412	-13.96274
1	-21.87169	-20.43187	-21.44356
2	-23.90041*	-21.26074*	-23.11549*

Note: * indicates lag order selected by the criterion; AIC: Akaike information criterion; SC: Schwarz information criterion; HQ: Hannan-Quinn information criterion.

4.3 Bounds Test of Cointegration

The results of the bounds test are presented in Table 3. The computed F-statistic is 31.59117, which exceeds the critical value of the upper bound. Therefore, it can be concluded that there is cointegration among the variables in the tested model, indicating the presence of a long-run relationship between youth unemployment and economic growth in Nepal.

Table 4.3: F-Statistic of Cointegration

Model	F-statistics	Critical values		
		Significance level	Lower bound	Upper bound
Youth Unemployment = f (GDP, Export, GNE, Population) K=4	31.59117	10%	2.2	3.09
		5%	2.56	3.49
		2.5%	2.88	3.87
		1%	3.29	4.37

Note: K indicates the number of regressors

4.3 Long Run Coefficients

This study estimated the long-run coefficients of the variables after confirming the presence of cointegration, as presented in Table 4.

Table 4.4: Estimated Long Run Coefficient

Variables	Coefficient	Std. Error	t-Statistic	Prob.
lnGDP	0.005149	0.001101	4.675084	0.0002
lnExport	-0.008859	0.003080	-2876554	0.0105
lnGNE	0.089276	0.025543	3.495199	0.0028
LnPopulation	0.028778	0.013070	2.201851	0.0418
C	2.069557	0.249981	8.278844	0.0000

GDP Growth

The estimated coefficient for GDP growth is 0.005149, with a corresponding t-statistic of 4.675084 and a p-value of 0.0002. This indicates a statistically significant positive relationship between GDP growth and youth unemployment in the long run. The result suggests that a one percentage point increase in GDP growth is associated with a 0.51% increase in youth unemployment. While economic growth generally reduces unemployment, this finding implies that the type or nature of GDP growth in Nepal may not be effectively reducing youth unemployment, possibly due to a mismatch between the skills required by growing industries and the skills possessed by the youth.

Export

The coefficient for exports is -0.008859, with a t-statistic of -2.876554 and a p-value of 0.0105. This negative coefficient indicates a significant inverse relationship between exports and youth unemployment. The result implies that a one percentage point increase in exports is associated with a 0.89% decrease in youth unemployment. This finding suggests that boosting exports plays a role in alleviating youth unemployment, potentially by fostering job opportunities in export-driven sectors.

Gross National Expenditure

The coefficient for gross national expenditure is 0.089276, with a t-statistic of 3.495199 and a p-value of 0.0028. This positive coefficient indicates a significant positive relationship between gross national expenditure and youth unemployment. The result suggests that a one percentage point increase in gross national expenditure is associated with an 8.9% increase in youth unemployment. This counterintuitive finding may imply that the increased expenditure is not effectively directed towards sectors that employ youth or that it contributes to inflationary pressures, thereby diminishing the real purchasing power and subsequently reducing employment opportunities for youth.

Population

The coefficient for population is 0.028778, with a t-statistic of 2.201851 and a p-value of 0.0418. This positive coefficient indicates a statistically significant positive relationship between population growth and youth unemployment. The result implies that a one percentage point increase in population is associated with a 2.8% rise in youth unemployment. This finding underscores the strain that a growing population exerts on the job market, where the labor supply may exceed demand, leading to higher unemployment rates among young individuals.

The results of your ARDL model reveal nuanced insights into the factors influencing youth unemployment in Nepal. While GDP growth positively correlates with youth unemployment, indicating potential structural issues in the economy, exports play a crucial role in reducing youth unemployment. Gross national expenditure and population growth, on the other hand, are positively correlated with youth unemployment, highlighting areas where policy interventions

might be necessary. These findings can guide policymakers in devising targeted strategies to address youth unemployment effectively.

4.4 Error Correction Model

The short-run dynamics and their coefficients, along with the error adjustment process in the long-run equilibrium, were examined using an error-correction model (Table 5). The coefficient for the error correction term is -0.754806, with a t-statistic of -13.59141 and a p-value of 0.0000. This highly significant negative coefficient indicates a robust correction mechanism in the model, implying that deviations from the long-run equilibrium are adjusted by approximately 75.48% each period. The negative sign and the high significance level of the error correction term (ECT) confirm that the system is readjusting towards equilibrium following a short-run shock.

Table 4.5: ARDL Short-run and ECM Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LNGDP	0.004484	0.000778	5.761794	0.0000
LNEXPORT	-0.029498	0.007398	-3.987538	0.0000
LNGNE	0.035062	0.052291	0.670521	0.5092
LNPOP	0.713174	0.145506	4.901353	0.0001
ECT(-1)	-0.754806	0.055536	-13.59141	0.0000
C	0.011930	0.002160	5.523459	0.0000

R-squared: 0.921853; Adjusted R-squared: 0.904864; S.E. of regression=0.004996; Sum squared resid=0.000574 Log likelihood: 115.8843; F-statistic: 54.26331; Prob(F-statistic)=0.00000; ECT= error correction term, and C=constant.

GDP Growth

The coefficient for GDP growth is 0.004484, with a t-statistic of 5.761794 and a p-value of 0.0000. This indicates a statistically significant positive relationship between GDP growth and youth unemployment in the short run. The finding suggests that a one percentage point increase in GDP growth is linked to a 0.44% rise in youth unemployment. This seemingly counterintuitive outcome may indicate that in the short term, GDP growth in Nepal may not immediately translate into job opportunities for youth, possibly due to delayed effects, structural mismatches in the economy, or growth occurring in sectors that do not predominantly employ young workers.

Export

The coefficient for exports is -0.029498, with a t-statistic of -3.987538 and a p-value of 0.0000. This indicates a statistically significant negative relationship between exports and youth unemployment in the short run. The finding suggests that a one percentage point increase in exports is associated with a 2.94% decrease in youth unemployment. This implies that an expansion in export activities likely leads to job creation and opportunities for young workers in Nepal, possibly because export-driven sectors may be more labor-intensive and thus more effective at generating employment for youth.

Gross National Expenditure

The coefficient for gross national expenditure is 0.035062, with a t-statistic of 0.670521 and a p-value of 0.5092. This indicates that gross national expenditure is not statistically significant in affecting youth unemployment in the short run, as the p-value exceeds the conventional threshold of 0.05. The lack of significance suggests that short-term fluctuations in national expenditure do not have a notable impact on youth unemployment. This could be due to the nature of expenditure, which may not directly influence employment or may be directed towards non-labor-intensive sectors.

Population

The coefficient for population is 0.713174, with a t-statistic of 4.901353 and a p-value of 0.0001. This indicates a statistically significant positive relationship between population growth and youth unemployment in the short run. The finding suggests that a one percentage point increase in the population is associated with a 71.31% rise in youth unemployment. This significant and large coefficient implies that population growth may be outpacing the economy's capacity to create sufficient job opportunities for young people, leading to higher youth unemployment rates.

The short-run results from the ARDL model indicate complex dynamics between economic growth, exports, national expenditure, population, and youth unemployment in Nepal. The positive relationship between GDP growth and youth unemployment in the short run suggests potential lagged effects of economic growth on employment. The negative relationship between exports and youth unemployment underscores the importance of export-led growth in reducing unemployment. The non-significance of gross national expenditure implies that other factors

might be more crucial in the short run. The strong adjustment indicated by the error correction term highlights a quick reversion to long-run equilibrium. These findings provide valuable insights for policymakers aiming to address youth unemployment through targeted economic and demographic policies.

4.5 Granger Causality Test

The finding that GDP growth Granger-causes youth employment is an important insight. It suggests that economic growth, as measured by increases in GDP, tends to precede and drive improvements in youth employment levels in Nepal over the sample period. This aligns with economic theory, where overall growth and expansion of the economy creates more job opportunities, including for the youth segment of the labor force. The bi-directional causality between exports and youth employment indicates an interdependent relationship. On one hand, growth in exports could stimulate economic activity, creating employment avenues for the youth. Conversely, a well-educated and skilled youth workforce could boost a country's export competitiveness and facilitate export growth. Similarly, the two-way causality between population and youth employment points to a complex interplay. Population dynamics influence and are influenced by labor market conditions for the youth.

Interestingly, no causal link is observed between gross national expenditure and youth employment. This could imply that domestic consumption and investment patterns, as proxied by gross national expenditure, may not be a significant direct driver of youth employment dynamics in Nepal during the study period. The lack of causality between GDP and exports, as well as GDP and gross national expenditure, is somewhat surprising. It suggests that Nepal's economic growth over the sample may not have been heavily reliant on export performance or domestic demand factors captured by gross national expenditure. Other potential drivers, such as remittances, sectoral shifts, or productivity changes, could be at play and warrant further investigation. Overall, these findings highlight the intricate relationships between macroeconomic factors, trade dynamics, demographics, and labor market outcomes, specifically concerning youth employment in Nepal. Policymakers and researchers may find value in further unpacking these causal mechanisms, accounting for potential non-linearities and structural changes, to inform targeted strategies for promoting inclusive economic growth and addressing youth unemployment challenges in the country.

Table 4.6: Granger Causality Test

Casualty	F-Statistic	Prob.
GDP growth doesn't ganger cause youth unemployment	7.65566	0.0030
Youth unemployment doesn't ganger cause GDP growth	0.52528	0.5986
Export doesn't ganger cause youth unemployment	1.96912	0.16606
Youth unemployment doesn't ganger cause export	3.75489	0.0375
Gross national expenditure doesn't ganger cause youth unemployment	1.97355	0.1600
Youth unemployment doesn't ganger cause gross national expenditure	1.62511	0.2170
Population doesn't ganger cause youth unemployment	3.20475	0.0577
Youth unemployment doesn't ganger cause population	9.01239	0.0011
Export doesn't ganger cause GDP growth	0.56253	0.5777
GDP growth does not ganger cause export	1.02886	0.3740
Gross national expenditure doesn't ganger cause GDP growth	0.79501	0.4641
GDP growth doesn't ganger cause gross national expenditure	0.08513	0.9187
Population doesn't ganger cause GDP growth	0.05271	0.9488
GDP growth doesn't ganger cause population	0.30614	0.7394
Gross national expenditure doesn't ganger cause export	4.09559	0.02289
Export doesn't ganger cause gross national expenditure	1.89366	0.1715
Population doesn't ganger cause export	6.14289	0.0068
Export doesn't ganger cause population	1.40828	0.2633
Population doesn't ganger cause gross national expenditure	2.52070	0.1006
Gross national expenditure doesn't ganger cause population	0.90115	0.4189

4.6 Diagnostic Test Results

The reliability of the estimated ARDL model was assessed through diagnostic tests, such as heteroscedasticity, serial correlation, and normality, as shown in Table 6. Heteroscedasticity was examined using the Harvey test, serial correlation was assessed using the Breusch-Godfrey test, and normality was assessed through the Jarque-Bera statistic.

Table 4.7: Diagnostic Test of ARDL Model

	Tests	F-statistic	P-value	Conclusion
Heteroskedasticity	Harvey test	0.849436	0.5920	No heteroscedasticity in residuals. There is homoscedasticity
Serial correlation	Breusch-Godfrey test	2.181509	0.1474	No serial correlation in residuals/residuals are not serially correlated
Normality	Jarque-Bera statistic (4.064525)		0.0562	Residuals are normally distributed

Heteroskedasticity

The Harvey test for heteroskedasticity resulted in an F-statistic of 0.849436, with a p-value of 0.5920. Since the p-value is substantially higher than the standard significance level of 0.05, fail to reject the null hypothesis of homoscedasticity. This suggests that there is no evidence of

heteroskedasticity in the residuals of the model, implying that the error variance remains constant across observations.

Serial Correlation

The Breusch-Godfrey test for serial correlation produces an F-statistic of 2.181509 with a p-value of 0.1474. Since the p-value exceeds 0.05, fails to reject the null hypothesis of no serial correlation. This suggests that the residuals of the model are not serially correlated. The absence of serial correlation implies that the error terms are independent over time, which enhances the reliability of the standard errors and the validity of the statistical tests.

Normality

The Jarque-Bera test statistic returned a value of 4.064525 with a corresponding p-value of 0.0562. While the p-value is slightly higher than the usual threshold of 0.05, it's close enough to merit attention. Given that it's just above 0.05, fails to reject the null hypothesis that the residuals follow a normal distribution.

These diagnostic results suggest that the ARDL model is well-specified, and the inferences drawn from it regarding the relationship between economic growth and youth unemployment in Nepal are reliable. These findings provide confidence in the robustness of the model and its suitability for policy analysis and recommendations.

4.7 Stability Analysis

To mitigate the risk of functional form misspecification stemming from the volatility of time series data, it is essential to conduct a parameter stability test (Guan et al., 2015). In this regard, the cumulative sum (CUSUM) and cumulative sum of squares (CUSUMQ) tests were employed to assess the stability of the coefficients in the estimated ARDL model. The CUSUM test identifies systematic changes in regression coefficients, while the cumulative sum of squares test detects abrupt alterations in the constancy of regression coefficients (Brown et al., 1975). Figures 1 and 2 display the CUSUM and CUSUMSQ plots, respectively, which provide evidence that the estimated parameters in this model remain stable, as the CUSUM and CUSUMSQ test statistics fall within the range bands at a 5% confidence interval.

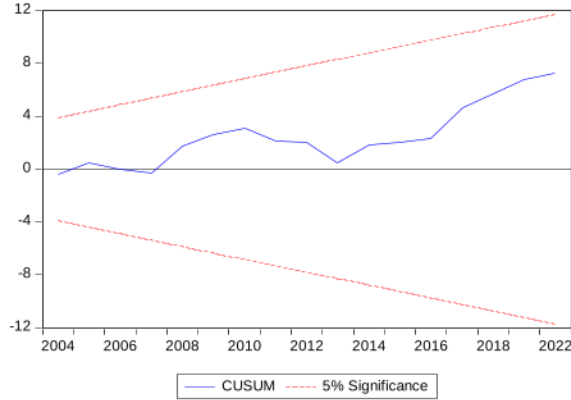


Figure 1: CUSUM Plots

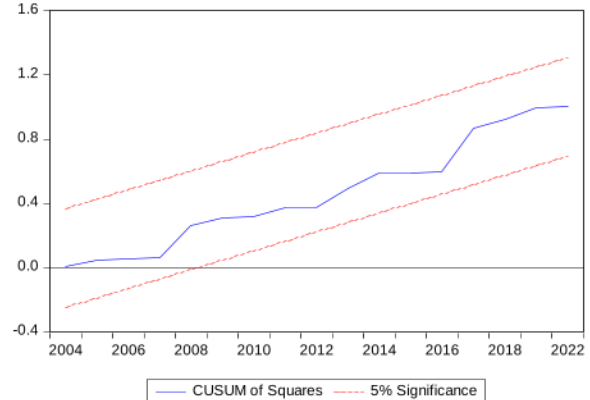


Figure 2: CUSUMSQ

4.8 Discussion

GDP Growth and Youth Unemployment

The statistically significant positive relationship between GDP growth and youth unemployment in both the short and long run, as indicated by ARDL modeling results, can be attributed to various economic dynamics. In Nepal, an increase in GDP growth typically reflects economic expansion and increased economic activity (Karki et al., 2020). However, this growth may not always directly translate into job creation, especially for the youth demographic. In the short run, rapid GDP growth can lead to a surge in economic output without an immediate proportional increase in job opportunities (Omoyele et al., 2022). This mismatch between economic growth and employment generation can result in higher youth unemployment rates as the economy struggles to absorb the growing labor force efficiently. In the long run, the positive relationship between GDP growth and youth unemployment may persist due to structural factors within the economy. For instance, if economic growth is driven by sectors that are not labor-intensive or if there are mismatches between market-demanded skills and those possessed by the youth population (Chen, 2016; Park & Arce, 2019), unemployment rates can remain elevated despite overall economic expansion. Moreover, this relationship could also be influenced by factors such as population growth outpacing job creation, limited economic diversification leading to job scarcity in certain sectors, or challenges in translating economic growth into inclusive development that benefits the youth population. These findings suggest a complex interplay between economic growth and youth unemployment in Nepal, highlighting the importance of targeted policies to address youth unemployment challenges amidst economic growth initiatives.

Export and Youth Unemployment

The negative coefficients for exports in both time frames suggest that an increase in exports is associated with a decrease in youth unemployment. In the short run, a one percentage point increase in exports is linked to a 2.95% decrease in youth unemployment. This finding aligns with the notion that export-oriented growth can create job opportunities, particularly for youth (Battad et al., 2022). When exports rise, domestic firms often need to expand production, leading to increased labor demand and reduced unemployment (Hjazeen et al., 2021; Abid et al., 2023). The long-run relationship is also significant, with a one percentage point increase in exports associated with a 0.89% decrease in youth unemployment. This result underscores the importance of sustained export growth in reducing youth joblessness over time. As exports expand, firms may invest in capacity building, technology upgrades, and workforce development, further enhancing their competitiveness and ability to absorb young workers (Coruche, 2022).

The magnitude of the effect is smaller in the long run compared to the short run. This could be due to various factors, such as skill mismatches, labor market rigidities, or structural changes in the economy that may limit the ability of exports to continuously drive down youth unemployment (Bastola, 2020). Policymakers should address these issues to maximize the long-term benefits of export-led growth for youth employment. The findings highlight the crucial role of exports in reducing youth unemployment in Nepal, both in the short and long run. Promoting export-oriented industries, improving trade infrastructure, and investing in human capital development can help harness the potential of exports to create more job opportunities for youth. Ongoing monitoring and policy adjustments may be necessary to ensure that the benefits of export growth are sustained and equitably distributed across the labor market.

Gross National Expenditure and Youth Unemployment

The significant positive relationship between gross national expenditure and youth unemployment in the long run, as indicated by the ARDL modeling results, suggests that increased expenditure at the national level contributes to higher youth unemployment rates over an extended period in Nepal (Pokhrel & Khadka, 2019; Bastola, 2020; Ngubane et al., 2023). This relationship can be attributed to various economic mechanisms that unfold over time. In the long run, the positive association between gross national expenditure and youth unemployment may stem from the complex dynamics of resource allocation and economic development. A sustained increase in expenditure, while beneficial for economic growth, may not always lead to a proportional reduction in youth unemployment (Ayinla & Ogunmeru, 2018) due to factors such as inefficiencies in resource utilization, structural mismatches in the labor market, or inadequate skill development programs that hinder the absorption of the youth workforce.

In the short run, the lack of statistical significance between gross national expenditure and youth unemployment may be influenced by the immediate impact of expenditure patterns on employment generation (Mehmetaj & Xhindi, 2022). Short-term fluctuations in expenditure may not directly translate into substantial changes in youth unemployment rates due to factors such as the time lag required for investments to materialize into job opportunities or the efficiency of resource allocation in the economy. Additionally, the non-significant relationship in the short run could be indicative of other dominant factors influencing youth unemployment during shorter time frames. It is possible that in the short term, other variables like GDP growth, export performance, or demographic shifts play a more significant role in shaping youth unemployment trends, overshadowing the impact of gross national expenditure. The contrasting results between the short and long run underscore the intricate nature of the relationship between gross national expenditure and youth unemployment, emphasizing the need for targeted policies that address both immediate and long-term challenges in the labor market to effectively reduce youth unemployment rates in Nepal.

Population and Youth Unemployment

The ARDL results reveal a dynamic relationship between population growth and youth unemployment in Nepal, both in the short and long run. The positive coefficients for population growth in both time frames suggest that an increase in population is associated with an increase in youth unemployment. In the short run, a one percentage point increase in population is linked to a 71.3% point increase in youth unemployment. This finding aligns with the notion that rapid population growth can exacerbate the challenge of creating sufficient job opportunities for the growing labor force, particularly for young workers (Lin, 2012; Ali et al., 2021). When population grows faster than the economy, it can lead to a surplus of labor supply relative to demand, putting downward pressure on wages and increasing unemployment (Hjazeen et al., 2021). The long-run relationship is also significant, with a one percentage point increase in population associated with a 2.8% increase in youth unemployment. This result highlights the importance of managing population growth to maintain a balance between labor supply and demand over time. Sustained high population growth can strain the economy's capacity to absorb new entrants into the labor market, leading to persistent youth unemployment (ILO, 2013).

The magnitude of the effect is smaller in the long run compared to the short run. This could be due to various factors, such as the potential for population growth to slow down over time, the ability of the economy to adapt and create new job opportunities, or the implementation of policies aimed at addressing the challenges posed by population growth (Lin, 2012; Kumar, 2020). Policymakers should consider a range of strategies, including family planning, education, and labor market reforms, to manage population growth and its impact on youth employment. The findings highlight the crucial role of population growth

in shaping youth unemployment in Nepal, both in the short and long run. Promoting sustainable population policies, investing in human capital development, and creating an enabling environment for job creation can help mitigate the negative effects of population growth on youth employment. Ongoing monitoring and policy adjustments may be necessary to ensure that the economy can keep pace with the changing demographic landscape and provide sufficient opportunities for young workers to thrive.

Chapter-5

Conclusion, Implication and Limitation

5.1 Conclusion

The relationship between economic growth and youth unemployment in Nepal is a complex and critical issue that demands nuanced understanding and targeted interventions. This study reveals that GDP growth alone is insufficient to address the challenges of youth unemployment, highlighting the need for a multifaceted approach to economic development and job creation. The findings underscore the significance of export-led growth as a key driver in reducing youth unemployment, emphasizing the importance of policies that promote international trade and enhance Nepal's global economic integration. Additionally, the study identifies a positive correlation between population growth and youth unemployment, indicating the necessity for demographic policies that effectively manage labor market pressures. To address these challenges, policymakers must craft strategies that combine short-term solutions with long-term economic planning, encompassing targeted economic policies, export promotion initiatives, and demographic management strategies. The insights from this study provide a valuable foundation for developing effective strategies that address youth unemployment while fostering sustainable economic development. By adopting this comprehensive approach, Nepal can create a more favorable environment for youth employment, align economic growth with the needs of its young workforce, and ultimately contribute to broader national prosperity and social stability. This multifaceted strategy requires the concerted efforts of government, private sector, and civil society to harness the potential of Nepal's young population, driving economic growth and social progress in the years to come.

5.2 Practical Implication

The long-run results highlight some concerning implications for Nepal's economic development and labor market dynamics. The positive relationship between GDP growth and youth unemployment suggests that the nature of economic growth in Nepal may not effectively translate into job opportunities for the youth population. This could be attributed to structural mismatches between the skills demanded by growing industries and the skills possessed by the youth labor force. It is imperative to address this mismatch through targeted investments in

education, vocational training, and labor market policies that align the supply of youth labor with the demands of growing sectors.

The negative relationship between exports and youth unemployment underscores the importance of promoting export-driven industries, which may provide employment opportunities for young workers. However, the positive association between gross national expenditure and youth unemployment is counterintuitive and concerning. It suggests that public spending may not be effectively channeled towards sectors that generate employment for the youth or may be contributing to inflationary pressures that erode the real purchasing power and job prospects of young individuals.

Furthermore, the positive relationship between population growth and youth unemployment highlights the urgency of addressing demographic challenges. A rapidly growing population coupled with inadequate job creation can exacerbate youth unemployment, potentially leading to social and economic instabilities. Policymakers should prioritize policies that promote sustainable population growth, invest in human capital development, and foster an enabling environment for job creation, particularly in sectors that can absorb the expanding youth labor force.

The short-run results reinforce some of the long-run findings but also reveal additional insights. The positive relationship between GDP growth and youth unemployment in the short run suggests that the benefits of economic growth may not immediately translate into job opportunities for the youth. This could be due to delays in the labor market's response to economic growth or structural rigidities that impede the efficient allocation of labor.

The strong negative relationship between exports and youth unemployment in the short run further highlights the potential of export-driven industries to generate employment for young workers. Policymakers should explore strategies to promote export competitiveness, such as investments in infrastructure, trade facilitation, and access to international markets.

While gross national expenditure does not significantly impact youth unemployment in the short run, the lack of significance should not be interpreted as a lack of importance. Rather, it underscores the need for targeted and efficient public spending that directly addresses the root causes of youth unemployment, such as skills development, job creation, and labor market reforms.

The short-run impact of population growth on youth unemployment is particularly alarming, with a one percentage point increase in population associated with a staggering 71.31% rise in youth unemployment. This finding emphasizes the urgency of addressing population growth and ensuring that economic growth and job creation outpace the expansion of the labor force, especially among the youth.

This study offers valuable insights into the complex dynamics between economic growth, trade, public expenditure, population growth, and youth unemployment in Nepal. Policymakers should prioritize a multi-faceted approach that addresses structural mismatches, promotes export-driven industries, targets public spending towards employment-generating sectors, invests in human capital development, and implements policies to manage population growth and foster sustainable job creation for the burgeoning youth labor force.

5.3 Limitation

The limitations of the study are as follows:

- While the study utilizes a rich dataset spanning 31 years, from 1991 to 2022, sourced from the World Bank, there may still be limitations in the data's granularity and coverage. For example, the data might not capture nuanced regional variations within Nepal or specific industry-level dynamics that could significantly impact youth unemployment.
- The study focuses on key variables like GDP growth, exports, gross national expenditure, and population, which are undoubtedly crucial. However, there could be other variables or factors not included in the analysis that could also influence youth unemployment, such as education levels, industry-specific trends, or technological advancements affecting job availability.
- Given the nature of time series data and the interplay between economic variables, there might be issues of endogeneity and bidirectional causality that could affect the estimated relationships. For instance, while the study identifies relationships between GDP growth and youth unemployment, it's crucial to explore potential reverse causation or omitted variable bias.
- While the diagnostic tests indicate that the model is well-specified and the results are reliable, it's always beneficial to validate the model's predictions using out-of-sample data or alternative modeling techniques to ensure robustness and reliability of the findings.

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